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Certified by

Jon W Dudas

Acting Under Secretary of Commerce
for Intellectual Property
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET
This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR §1.53(c).

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Docket No. 03-759	Type a plus sign (+) inside this box:	+

INVENTOR(S)/APPLICANTS(S)

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TITLE OF THE INVENTION (280 character maximum)

A METHOD AND SYSTEM TO ENABLE EMAIL SERVICES FOR MOBILE DEVICES

CUSTOMER NUMBER

20306

McDonnell Boehnen Hulbert & Berghoff

ENCLOSED APPLICATION PARTS (check all that apply)

☒ Specification Number of Pages 5   ☐ Drawings Number of Sheets

☐ Other:

METHOD OF PAYMENT FOR THIS PROVISIONAL APPLICATION FOR PATENT

☒ Applicant claims small entity status. See 37 CFR 1.27

☒ A check or money order is enclosed to cover the Provisional Filing Fee.

☐ The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: 13-2490.

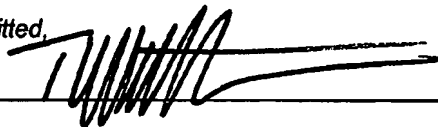| PROVISIONAL APPLICATION FOR PATENT FILING FEE AMOUNT ($)	80.00

CERTIFICATE OF MAILING

I hereby certify that, under 37 CFR § 1.10, I directed that the correspondence identified above be deposited with the United States Postal Service as "Express Mail Post Office to Addressee," addressed to Mail Stop Provisional Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on the date indicated below.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government. _____ No. _____ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE: _____   Date: July 31, 2003

TYPED or PRINTED NAME Thomas E. Wettermann   REG. NO. 41,523

☐ Additional inventors are being named on separately numbered sheets attached hereto.

Title
A method and system to enable email services for mobile devices

Background
A large number of mobile terminals currently offered to be used in GSM based cellular networks includes features to send and retrieve email using the well defined and established internet protocols SMTP and POP3 over CSD, HSCSD, GPRS and UMTS.

Some Carriers offer email services to their customer base today, which can be used also to send and receive email with mobile terminals. But only a small number of customers are using this service offering.

One important reason for the limited market acceptance is the user individual configuration of the mobile terminal. Without this very technical and error prone configuration it is not possible to send and receive email on a mobile terminal.

To enable POP3/SMTP capable mobile terminals to use email services of a mobile operator, in existing solutions it is required to configure a number of parameters on the mobile terminal.
These parameters include:

- For email retrieval:
  - Name of the email server to receive email from
  - Username for email retrieval
  - Password for email retrieval
- To send email:
  - Email address of the sender
  - Name of the email server to be used for sending email
  - Username for sending email (if necessary)
  - Password for sending email (if necessary)

While some of the parameters are individual only for the mobile operators email service, others are specific for the individual user. This applies for:

- Username for email retrieval
- Password for email retrieval
- Email address of the sender
- Username for sending email (if necessary)
- Password for sending email (if necessary)

A significant number of parameters are required to be configured individually by the user.

The usual solution provided in the mobile operators environment to configure mobile terminals for certain services is named "over the air configuration" (OTA). This means to configure the terminal by sending a short message to the terminal with the individual configuration parameters. Since this message is formatted in special way, the receiving terminal interprets the message as a configuration command.

However, today's terminals usually do not offer the ability for email parameter configuration over the air. The user is left alone to configure the terminal as required. Additionally the service provisioning process of operators usually does not contain this configuration automatically. Therefore even if the phone can be configured over the air, the customer must be aware of this and obliged to get the configuration – which is unlikely in most cases.

The invention described in this document differs from other inventions in this area (e.g. WO02/49373A2, a method and arrangement for configuring a mobile telephone) in that

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- It is not required to configure the phone (manually or automatically) before it can be used by the customer to access the operators mail service. Especially it is not required to provide customer particular data like username, password or personal name.

- In case that the customer changes or is forced to change a part of his configuration relevant and individual data set (e.g. mail address, username, password, mail server name) it is – in difference to other approaches – not required to change or refresh the handset configuration.

- No handset specific adoption of the service is required – in contrast to OTA services.

Thus the invention has the advantage that it increases the usability and convenience for the customer. Additionally it is advantageous for the operator, since the change of a password is usually not integrated into the operator's business processes at a level that will automatically send a configuration SMS or OTA message to the users mobile phone. Only a subset of mobile phones available on the market today, support OTA configuration or SMS configuration for email services, which is a disadvantage for existing solutions.

Aim of the Invention

The aim of the invention is to allow the integration of email-enabled devices into a carrier service network without the need for user individual configuration.

Summary
The invention is a system, which allows the integration of email-enabled devices into a carrier service network without the need for user individual configuration.

The invention is applicable for most mobile operators to set up an attractive and relative simple mail server for their customers. Not only mail services of the mobile operator can be used with this system, also other mail service providers can be used, if the user is willing to provide the mobile operator with the required data and credentials.
Basically the invention is applicable also for DSL Service Providers and fixed Network ISPs.

In the detailed description an embodiment of the invention is explained in detail.

Detailed description
The invention is a system, which allows the integration of email-enabled devices into a carrier service network without the need for user individual configuration.

The invention is applicable for most mobile operators to set up an attractive and relative simple mail server for their customers. Not only mail services of the mobile operator can be used with this system, also other mail service providers can be used, if the user is willing to provide the mobile operator with the required data and credentials.
Basically the invention is applicable also for DSL Service Providers and fixed Network ISPs.

The invention works as follows:

Mobile Terminal
Mobile terminals are equipped with default values for individual mobile operators by the mobile terminal manufacturer. This is common practice in the mobile telecommunications industry. The manufacturer is setting up the mobile terminal with default e-mail parameters for the individual mobile operator. This parameter set comprises on or more of the following items:

- GPRS APN to be used by the individual mobile operator to send and retrieve email
- Mobile operator individual name for the email server to receive email from
- Mobile Operator individual default username for email retrieval
- Mobile Operator individual default password for email retrieval
- Mobile Operator individual email address of the sender
- Mobile Operator individual name for the email server to be used for sending email
- For sending email, the terminal will be configured to use standard SMTP without further authentication (no SMTP Auth)
- Username and password for sending email remain unset

Network & Service Delivery Platform
The network operator ensures that elements of the individual service platform are available at the IP addresses pre-configured in the handset for sending email (SMTP-Server) and mail retrieval (POP3-Server).

Additionally the mobile operator takes care, that during the communication link establishment conducted by the mobile handset, the individual MSISDN (or another user id) and the associated TCP/IP address leased to the handset are recorded (usually based on a RADIUS protocol request). Therefore the mobile operator is capable to map any active IP address in the named APN to the MSISDN and vice versa.

The required delivery platform is described by the following figure.
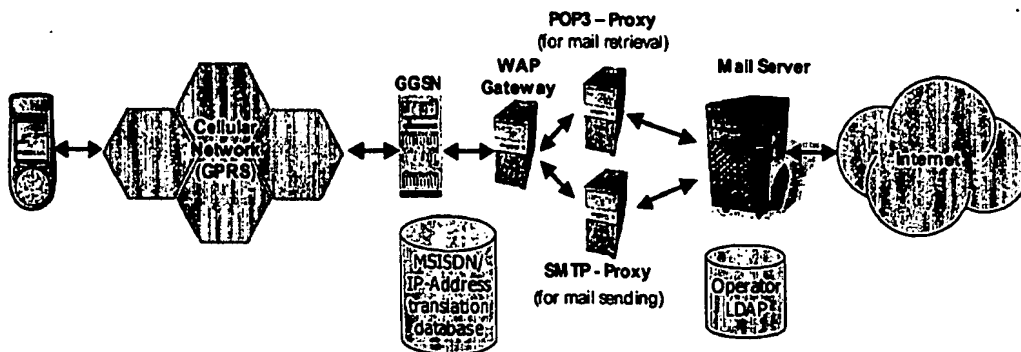
A user with a POP3/SMTP capable handset is connected over the GSM/GPRS cellular network to the GGSN. TCP connections initiated by the mail user agent on the handset for retrieving mail from the mail server located on the right side of the figure lead over GGSN and WAP gateway. They terminate on the POP3 proxy. TCP connections initiated by the mail user agent on the handset for sending mail using SMTP lead also over GGSN and WAP gateway. They terminate on the SMTP proxy.

The MSISDN/IP-Address translation database contains mapping information for all handsets attached to the GPRS network and allows to map the IP address of a handset to it's MSISDN and vice versa.

The operator LDAP includes particular information about customers like MSISDN, name of the email server to receive email from, username for email retrieval, password for email retrieval, user's email address for sending mail, name of the email server to be used for sending email, username for sending email (if necessary), password for sending email (if necessary). This information can be accessed by providing the customer's MSISDN.

Retrieving Mail
At the point in time the mobile terminal user is checking for new email, the mobile terminal will turn to the mobile operators POP3 server. The POP3 server is a non standard server. It takes the requesting IP address, looks up the associated MSISDN and receives the original users username and password from

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a database or a LDAP directory. Based on this information the POP3 proxy server authenticates the user against the corresponding backend server and retrieves the mail for the customer from the original server. The data stream received from the original users mail server is for-warded to the mobile handset without modifications.

The course of steps to retrieve email is described by the following figure.
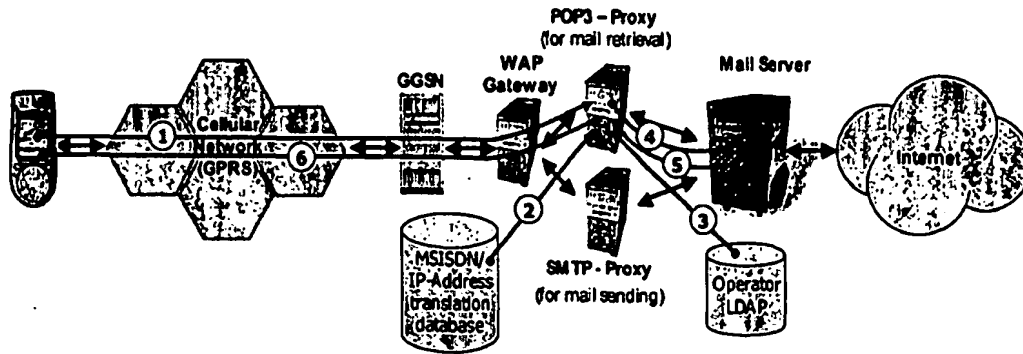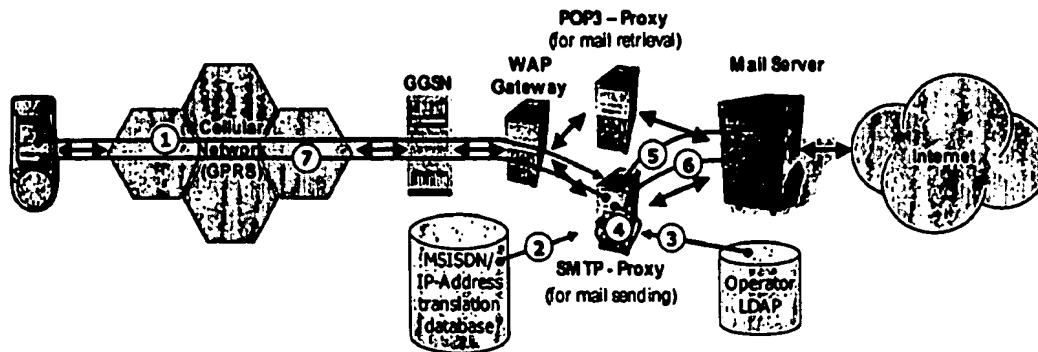

1. The mail user agent located on the handset connects to the POP3 proxy, authenticates itself with a predefined username and password and finally request the delivery of new mail. The authentication by predefined username and password does not provide any security. Each terminal will use the same username and password. Instead the POP3 proxy server identifies the customer by the IP address of his mobile terminal.
2. The POP3 proxy server uses the IP address used by the mobile terminal to lookup the customer's MSISDN from the MSISDN/IP address translation database.
3. The MSISDN found out with step 2 is used by the POP3 proxy server in step 3 to look up particular information about the customer from the operators LDAP: name of the email server to receive email from, username for email retrieval, password for email retrieval.
4. In step 4 this particular information is used by the POP3 proxy server to authenticate towards the original mail server using the POP3 protocol, instead of the user. By forwarding the mail retrieval request received from the handset, the necessary mail messages are retrieved from the original mail server.
5. The messages are transferred to the POP3 proxy server.
6. The POP3 proxy server forwards the retrieved messages to the handset.

Sending Mail
If a mobile user is going to send email from the mobile terminal, the mobile terminal will turn to the named SMTP server. This server is modified proxy version too. At the time of connection establishment, the server will look up the mobile users MSISDN and will retrieve the users email address, original SMTP server name, username and password from a database or a LDAP directory. Based on this information the SMTP proxy will replace the senders email address in the mail by the original email address of the mobile user. The so modified mail will be forwarded to the original SMTP mail server. If authentication is required, the SMTP proxy server will ensure this based on the original senders email address.

The course of steps to send email is described by the following figure.

POP3 – Proxy
(for mail retrieval)

WAP
Gateway

Mail Server

GGSN

Cellular Network (GPRS)

MSISDN/ IP-Address translation database

SMTP - Proxy
(for mail sending)

Operator LDAP

Internet

1. The mail user agent located on the handset connects to the SMTP proxy and delivers new mail to the SMTP proxy server. The SMTP proxy server identifies the customer by his IP address

2. The SMTP proxy server uses the IP address used by the mobile terminal to lookup the customer's MSISDN from the MSISDN/IP address translation database.

3. The MSISDN found out with step 2 is used by the SMTP proxy server in step 3 to look up particular customer information from the operators LDAP: name of the email server to be used for sending email, username for sending email (if necessary), password for sending email (if necessary).

4. Step 4 is characterized by a substitution process carried out by the SMTP proxy server. This translation replaces the default user data included in the mail from the handset by user data retrieved from the operator LDAP (username, senders e-mail address).

5. In step 5 the particular user information is used by the SMTP proxy server to authenticate towards the original mail server using the SMTP protocol instead of the user (if SMTP Auth is used). Finally the SMTP proxy server will forward the email received from the handset with applied replacements to the original mail server.

6. The SMTP proxy server receives a return message from the SMTP server.

7. This return message is forwarded to the handset.

Abbreviations used

CSD	Circuit switched Data
GPRS	Global Packet Radio Service
GGSN	Gateway GPRS Supporting Node
HSCSD	High Speed Circuit Switched Data
IP	Internet Protocol
ISP	Internet Service Provider
LDAP	Lightweight Directory Access Protocol
MSISDN	Mobile Station ISDN Number
POP3	Post Office Protocol Version 3
SMTP	Simple Mail Transfer Protocol
TCP	Transmission Control Protocol
WAP	Wireless Application Protocol

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